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ABSTRACT

Phase I of this project for the development of educational materials to teach the use of the computer (1) as an aid to management and decision making, or (2) as an instructional tool, included expansion of background technical reports, completion of computer programs, printing of field test versions of materials, commercial publisher interaction, and a market survey. Despite the existence of sizeable potential markets, lack of commercial interest in publication necessitated an analysis of alternative publication possibilities and a selection of a regional R & D laboratory as publisher. Appendix A contains the working marketing plan for the education materials dealing with the computer as an instructional resource. Appendix B contains the analysis of market survey results. (STS)

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Final Report for

COMPUTER APPLICATIONS PROJECT
PHASE 1

Submitted to the

National Institute of Education

by the

Northwest Regional Educational Laboratory
710 S.W. Second Avenue
Portland, Oregon 97204

August 31, 1976

IR004519

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Contract No. NIE-G-76-0039

Period:	February 1, 1976 to August 31, 1976
Date of Submission:	August 31, 1976
Name of Institution:	Northwest Regional Educational Laboratory Computer Technology Program
Title of Project:	Computer Applications Project
Name of Project Director:	Dr. Duane Richardson (through June 30, 1976)
NIE Division or Staff Office:	Technological Applications Division Finance/Productivity Group

MAJOR ACTIVITIES AND ACCOMPLISHMENTS DURING THIS PERIOD

During the period encompassed by this report, a number of activities were carried out to accomplish the aims of the project. Only those events and activities of major importance are summarized here.

1. Expansion of Technical Reports

In November of 1975, final Technical Reports were completed on the materials developed under contract number NE-C-00-3-0075. The reports were prepared to document the development and evaluation of two products: the Data Management and Decision Making series and the Selecting and Specifying Computer-Enhanced Units series.

Early in Phase I of the present contract, substantial portions of the Technical Reports described above were expanded and new material added so that the document would appeal to publishers and could serve as the basis for an RFP.

Specifically, the expanded sections include a discussion of the capabilities of the developer, evidence of need for the materials, detailed descriptions of each unit, intended user for the materials, further details of a needs assessment, and an extensive new analysis of costs and benefits. All of the expansions were specific to the purposes of the present project and not requisite for inclusion in reports for contract NE-C-00-3-0075.

2. Completion of Computer Programs

Several computer programs form an integral part of the materials. These programs were submitted to a technical review and revised to bring them to full operational status for publication. The review focused on the "bugs" revealed in field testing and the degree to which the computer programs would be transportable to other computer configurations and other manufacturers' equipment. The transportability question is a critical one which must be resolved, since the materials are likely to receive wide adoption and use. Particular attention was paid to program revision and documentation to assure such transportability, using the guidelines developed at ACT and adopted and distributed by CONDUIT.* These guidelines have been generally accepted as the best existing standards for programming in BASIC.

3. Printing of Materials

Fifty copies of the field test versions of both Data Management and Decision Making and Selecting and Specifying Computer-Enhanced Units were printed for distribution to potential publishers.

4. Commercial Publisher Interaction

A primary requirement of Phase I of the current Computer Technology contract with NIE was to conduct a market survey to determine such factors as (1) market(s) identification, (2) market(s)

*Gerald L. Isaacs, Interdialect Transportability of the BASIC Programming Language, ACT Technical Bulletin No. 11, March 1973. Reprinted and distributed by CONDUIT.

size, and (3) expected use patterns for the products (e.g., workshops, courses). It was originally the intent of the survey to show commercial publishers the wide-market potential of these computer training materials.

However, between February and May 1976, a number of informal contacts have been made with major commercial publishers, seeking to identify their level of interest in publishing the Computer Technology products (Data Management and Decision Making; Selecting and Specifying Computer-Enhanced Units). Included were Prentice-Hall, Harper & Row, Lippincott, Silver Burdett, Charles Merrill, and Xicom. None of these houses expressed any interest in being the publisher for these materials. While not in any way critical of the quality or usability of the products, all the above publishers expressed doubt about their commercial profitability. They categorized the products as having "thin market potential," according to their definition. What most commercial publishers are looking for is material capable of adoption for classroom use with "mass sales potential."

The design and conduct of the survey, along with pertinent findings, are reported in the following sections and in Appendix B. Preliminary analysis shows the existence of multiple significant markets (though not "mass" in the commercial sense) for quality computer training materials. This survey--at least in relative terms--refutes the opinions of commercial publishers that these materials should be considered "thin market."

5. Market Survey

The market survey was designed primarily to accomplish the above marketing needs and less to influence the opinion of commercial publishers toward the products. It was intended to determine market potential among a number of potential user audiences. Initial findings (as of August 25) are summarized in the following sections and in Appendix B. A full and complete report resulting from an analysis of the great amount of collected data will be completed by September 15 and submitted as an appendix to this document.*

Methodology. It was decided to design and conduct a one-phase nationwide direct mail survey (random sample) of several expected user audiences for the computer training products. (Because of the delay in conducting the survey, and the urgency in reporting findings to NIE, it seemed prudent to eliminate any followup contacts and focus on one strong research approach.) The target markets selected (based on known and/or perceived interest and work in the areas of operations research) were:

(1) For Data Management and Decision Making

- Professors of educational administration (college level)
- Professors of business administration (college level)
- Superintendents of large school districts (elementary/secondary)

*Due to the time required for exhaustive analysis of the data, it was deemed most important to provide the preliminary analyses in the present report, with detailed analyses following.

(2) For Selecting and Specifying Computer-Enhanced Units

- Professors of teacher education (college level)
- Superintendents of large school districts (elementary/secondary)
- Teachers of social sciences (secondary)
- Teachers of mathematics (secondary)

The process for survey design, including sample size and selection within each target population, was performed as follows:

- PROFESSORS OF EDUCATIONAL ADMINISTRATION: The sample was drawn from the membership listing of the University Council for Educational Administration. Of 960 member professors, a random sample of 368 (38%) was selected.
- PROFESSORS OF TEACHER EDUCATION: The sample was drawn from the membership listing of the American Association of Colleges for Teacher Education. Of 813 member institutions (and heads of education colleges or departments), a random sample of 287 (35%) was selected.
- PROFESSORS OF BUSINESS ADMINISTRATION: The American Assembly of Collegiate Schools of Business provided data indicating the existence of about 600 accredited schools of business administration. A sample size of 469 department heads (78%) was drawn from the mailing lists maintained by The Educational Directory, Marion, Ohio.

- SUPERINTENDENTS OF LARGE SCHOOL DISTRICTS: The sample was drawn from mailing lists available through Data Market Retrieval indicating the existence of 4,002 districts, each with K-12 student enrollment of more than 2,500. (This information was closely substantiated by the National Center for Educational Statistics at HEW reporting the existence of 4,000 districts.) Of 4,002 districts, a sample size of 1,664 (42%) was selected.
- SECONDARY TEACHERS: The sample was drawn from mailing lists available through The Educational Directory indicating the existence of 14,000 math and 15,000 social studies teachers. A random sample of each population (13% for math teachers, 8% for social studies) was selected. Since the survey was conducted during summer vacation, questionnaires were sent to teacher homes.

A simple yet encompassing survey instrument* was created for each target market. The general questions to which answers relative to marketing planning were desired included the following:

- Is there a market for the product(s)?
- Who is the market (user audience) for the product(s)?
- What is the size of each market? universe?
- What is the potential usage level of the product(s) by each market?
- Are there similar materials available? If so, what is their quality?

*A copy of each instrument will be found in Appendix B.

- Is pricing a major consideration in the purchase/use of the product(s)?
- What delivery mechanisms are appropriate for eaching each market?
- What is the expected manner of use of the product(s)? (e.g., classes? workshops? reference? preservice?)
- What is the most appropriate design for the product(s)?
- What is the accessibility of the market to needed instructional assists? (e.g., computer terminals)

The survey instrument, along with a personal letter and return stamped envelope were mailed nationwide to the samples specified below, with the response rates as shown.

Target market	Sample population	Percent (%) of sample surveyed	Instruments sent and received	No. of responses	Percent (%) responses
Prof. of teacher ed.	813	35%	287	127	44.3
Prof. of ed. admin.	960	38%	368	155	42.1
Prof. of bus. admin.	600	78%	469	102	21.7
Superintendents	4,002	42%	1,664	407	24.5
Secondary teachers	29,000	11%	3,085	429	13.9
TOTALS			5,873	1,220	20.8%

PROBLEMS AND DEPARTURES FROM THE ORIGINAL PLAN

1. Lack of Publisher Response

As was discussed previously, early contacts with publishers revealed they would not bid to publish the materials, due to their perception that

their market potential was thin. In recent years a faltering economy and decreased book sales have caused virtually every publisher to become more cautious in planning new publications. Books which were sought by publishers even two years ago are now rejected as representing too great a financial risk. Many of the major publishers contacted are placing lesser emphasis (at least in educational markets) on single books in favor of total long-term programs which span a number of grade levels and assure mass audience purchase. A number of those publishers contacted earlier were approached again in August with the findings of the market survey. Again, although reactions to the materials were positive, they were viewed as having too little potential for large commercial profits for the publishers to risk the capital investment. Since several promising publishing alternatives existed, it was decided to pursue each equally, but not to engage further in the tedious, time consuming tasks which would be necessitated by the more formal bidding route with commercial houses only.

2. Delay Due to Director Resignation

A special problem affecting timing was encountered due to the illness and subsequent departure of the Project Director at a critical time in the project. Because the director had primary responsibility for all project activities, this unexpected and unfortunate event delayed completion of Phase I. The NWREL Office of Marketing and Dissemination assumed responsibility for completing the market survey, and a new project director was appointed to carry out remaining Phase I

tasks and to begin planning for Phase II activities.

SIGNIFICANT FINDINGS AND EVENTS

1. Market Survey

Initial findings of the market survey show the existence of a number of potential (primary) markets among all the tested audiences. In addition, it is reasonable to infer from the results that other (secondary) audiences exist who will purchase and use the products. This discussion of primary and secondary markets will be covered later in specific product marketing plans for both Data Management and Decision Making and Selecting and Specifying Computer-Enhanced Units, which can be found in Appendix A to this document.

Appendix B presents conclusions for each of the five user audiences surveyed. In summary, the survey indicates the existence of multiple significant markets. In teacher and administrator education, a substantial need for training materials in computer use has been evident for the past decade. The use of computers in education is growing: A 1975 American Institutes for Research study projected instructional use would occur in 50% of all school districts by 1980, and in combination with administrative computer use would reach 100% by 1980. This increase in use has been paralleled by an increase in awareness of the need for training. Specificially:

- Secondary teachers feel that it is important to understand and even more important to be able to use the computer in

instruction, but fewer than half have ever received any formal training in this area.

- Almost none know of suitable materials for such training.
- Most would like to receive inservice training, preferably in the form of a short local or district workshop during the school year.
- Professors of teacher education feel the ability to use the computer is very important for teachers of science and math.
- About half of the teacher education programs in secondary math and science presently provide preservice training.
- Superintendents are now making computers available for classroom use, especially in the fields of science, mathematics and social studies.
- A large majority of superintendents have or will obtain computer access for their teachers and would budget funds for inservice training for teachers if a satisfactory training system becomes available.
- Superintendents do want their administrators trained to use computers for decision making and management at every level, particularly at the secondary and central office levels.
- Most superintendents report that very few now have such capabilities.
- Superintendents would offer inservice training and would budget money for it if there were a satisfactory training system available.

- An increasing number of school districts have or plan to obtain computer access, and at least half now have a computer expert in the district who could offer training if a satisfactory training system were available.
- Most universities do or plan to offer training in computer use for decision making as part of their program for school administrators, and almost all of them say their graduate students have access to the use of a computer on or near the campus.
- Very few (only 4%) are currently satisfied with the training materials available in computer use for decision making.
- Almost all respondents considered this type of training as growing in importance.

The approach to training of business administration students is perhaps more sophisticated than those other market categories surveyed. Training materials tend to be used to meet field-based needs. The application of the computer is not as new among business and management environments as perhaps other markets, and this shows in university and private industry orientation toward computer applications to problem solving, planning, and overall decision making.

Data Management and Decision Making appears to provide professors of business administration--as well as inservice trainers--with additional and needed quality materials for educating their students--and practicing managers--in operations research.

- The attention to training in operations research is along the same subject areas as is Data Management and Decision Making, and the lack of satisfaction in currently available training materials makes this product all the more inviting and needed.
- Student accessibility to computer terminals is quite high, a most positive feature in product usage.
- The inclass (preservice) potential of Data Management and Decision Making appears substantial among both graduate students and undergraduates. It is stronger when viewed as a required subject than as an elective (thus illustrating the importance given to such training).

2. Analysis of Alternative Strategies for Publication and Marketing

There are, of course, a number of ways to publish and market the computer training products to interested user audiences. While initial contacts with commercial publishers have not been encouraging, it seems appropriate herein to review all those alternatives available to moving the products out of the developmental stage and into the hands of administrators, teachers and others.

Table 1 outlines a number of alternative strategies relative to product(s) publication and marketing, including advantages and disadvantages for each.

TABLE 1: ALTERNATIVE MARKETING STRATEGIES
Available for Publication/Marketing of Computer Technology Products

Marketing Strategies	Advantages for Using Specified Strategy	Disadvantages for Using Specified Strategy
Government agency through Government Printing Office	• May provide copyright protection • Will price product primarily to recover costs • Has established general education networks nationwide • Has funds for some marketing tasks • Implies official approval of products	• Timing can often be delayed • Developer often supplements promotion and sales • Users have limited interaction with authors • May not clearly understand user audience needs • Developer loses marketing control • Lacks aggressive marketing strategy and approach
University press	• Provides copyright protection • Has funds for formatting, printing, and handling orders • Pays author a specified royalty • Will do limited editing and revising • Relieves developer of some marketing tasks • Is knowledgeable about education markets	• Lacks promotion and sales capacity • Will mark up price to recover costs • Developer loses some marketing control • Developer has to supplement promotion and sales tasks • Will have questionable understanding of user audience education needs
Regional R&D Laboratory (with emphasis on NWREL)	• Will price catalog primarily to recover costs • Has extensive knowledge of general education markets and networks • Has extensive understanding of user audience education needs • Is skilled in educational marketing • Works in cooperation with author • Will perform editing tasks • Will provide postpurchase analysis of user satisfaction • Timing to publish can usually be minimized • Has skilled graphic designers	• Usually cannot provide copyright protection • Usually has limited funds for investment • May be geographically restricted • No royalty arrangement exists
Field-based educational agency (e.g., State Department of Education, IED, educational association)	• Will price product with little markup for profit • Works in cooperation with developer • May have knowledge of user audience education needs and education markets or networks • May provide copyright protection	• May have limited knowledge of user audience education needs • May have limited knowledgeable staff to conduct marketing • Absence of strong sales and promotion capability • Will have limited funds for investment • Royalty may be absent
Commercial publisher (large, full-service house)	• Has funds for all dissemination tasks • Can format, produce, promote, inventory, sell and distribute • Experienced in education markets • Has field sales force for face-to-face contact • Provides copyright protection • Pays author a specified royalty (usually 10% to 18%) • Relieves developer of all marketing tasks (except supplemental promotion and postpurchase evaluation)	• Will want to perform extensive editing and revision • Will mark up price 300–400% to make profit • Participation usually results in critical delays (up to 9–12 months or longer) • May not understand user audience education needs • Developer relinquishes marketing control
Commercial publisher (small, limited-service house)	• Has funds for some marketing tasks • Can format, produce, inventory and ship to buyer • Will do little editing or revising • Usually can publish product with minimal delay • Pays author a specified royalty on sales • Provides copyright protection • Relieves developer of most marketing tasks	• Limited in promotion and sales capability • Will mark up price 300–400% to make profit • May have limited understanding of user audience education needs • Developer loses marketing control • Developer usually has to perform supportive promotion • Developer may have to edit and revise
Commercial printer (quasi-publisher)	• Has funds for formatting, printing and handling orders • Provides copyright protection • Pays author a specified royalty on sales • Relieves developer of some marketing tasks	• Absence of promotion and sales capability • Will mark up price to make profit • Will have little or no understanding of user audience education needs • Developer loses marketing control • Developer has to perform promotion and sales tasks

3. Recommendation of One Reasonable Strategy for Publication and Marketing

Of those strategies outlined in Table 1, one has been selected as the most feasible approach to recommend to NIE. This approach focuses on the capability of this particular R&D laboratory (NWREL) to complete, publish and disseminate nationally the computer technology products. Reasons for this recommendation include:

- Laboratory experience in the computer technology field: in development, publication and dissemination of training systems and materials (see Proposal for Computer Applications Project, Phase II, Appendix B: Program Description).
- Laboratory experience in publishing a variety of quality materials--text, supplemental and ancillary.
- Lack of current major commercial publisher interest in the products.
- Laboratory ability to perform publishing tasks as well--if not better--than smaller commercial publishers and other channels. Samples of recent NWREL publications are attached. As of August 27, Tests of Functional Adult Literacy has sold 1,245 copies since publication release in February 1976 to general public. Oral Language Tests for Bilingual Students has sold 437 copies since publication release in early August 1976. We expect major sales to occur for both publications after school starts in September.
- Expertise of Laboratory Computer Technology staff and Marketing Office in producing quality, usable products and

identifying and reaching appropriate users for those products.

- Laboratory knowledge of and access to educational markets, utilizing communications networks flowing both direct to users and through established channels such as state departments of education, associations, and so forth.

Working marketing plans for Data Management and Decision Making and Selecting and Specifying Computer-Enhanced Units will be found in Appendix A to this document.

4. Specifications for Revisions

The materials to be published have been through exploratory and pilot (formative) testing and extensive expert review, followed by revisions based on the results of this testing. Field testing was then carried out in college courses and workshop settings. The results of this field testing are documented in Technical Report No. 14 for Data Management and Decision Making and in the Technical Report for Selecting and Specifying Computer-Enhanced Units. Following the field test, the instructors for each group completed evaluative reviews, and an independent evaluation of the workshops and the materials was carried out by a professor at the University of Minnesota. The Marketing and Dissemination Office of NWREL also conducted an exhaustive prepublication review of the materials.

While these reviews generally indicate that both products successfully accomplish their stated objectives and compared very

favorably with competitive products, they also indicate the existence of some problems in design and content which should be corrected prior to publication. The present recommendations for revisions are in the areas listed below and represent the minimum revisions which will be accomplished. Before proceeding into this final revision, however, extensive review by a user panel will be conducted to obtain precise and detailed recommendations concerning the exact nature of changes needed to bring the products to final publication form.*

Data Management and Decision Making

- Rewrite to simplify language used and to remove excessive verbiage, especially in booklets on "Queueing Theory," "Linear Programming" and "Computer Simulation."
- Develop a complete summary of points for "PERT/CPM" booklet.
- Develop a complete rationale for each booklet for the importance and utility of the technique in educational administration.
- Provide the "Computer Simulation" booklet with three simpler examples representing different types of simulations, prior to the introduction of the present two examples.
- Provide the "Computer Simulation" booklet, programs and text with user option to use the data already stored in programs,

*See A Proposal for Computer Applications Project, Phase II, August 31, 1976, for detailed methodology for this review and revision process.

as well as the option to use their own data; change programs accordingly.

- Provide a more visually instructive format.
- Develop annotated lists of references for each booklet.
- Develop more examples, activities and projects for each booklet--with particular emphasis on those using the learner's own data.
- Revise all programs to simplify user interface with the computer and to eliminate the need for extensive data input by the user.

Selecting and Specifying Computer-Enhanced Units

- Develop and add annotated lists of references for each background booklet.
- Reconsider titles of all booklets and change as revision of the booklets requires.
- Revise and expand the booklet, "How to Select," including:
  - Develop new materials on evaluation criteria, including in it a condensed discussion of the presently given bases for decision.
  - Delete decision tables.
  - Develop substantive new material on the design and development of programs for instructional use.
  - Expand and annotate the present list of sources of instructional materials, including price and availability information.

- Expand present material on computer-managed instruction "Roles" booklet to include a discussion on its incorporation into many CAI programs.
- Revise the "Software" booklet, including:
  - De-emphasize the material on skills of recognizing languages and develop and add substantive new material on the characteristics and uses of BASIC, FORTRAN, and APL to form the core of the revised booklet.
  - Develop an introduction to CAI author languages for "Software" booklet, including the characteristics and uses of the languages.
  - Develop materials to teach users the skills necessary to revise and tailor existing programs in BASIC to fit their specific instructional needs.

A final expert outside review will be conducted before the final format is selected, with particular attention to internal format, visual impact and packaging.

DISSEMINATION ACTIVITIES, CAPITAL EQUIPMENT ACQUISITIONS, DATA COLLECTION, OTHER ACTIVITIES

None

STAFF UTILIZATION

As noted earlier, a significant change in staff personnel was the illness and subsequent departure of the Project Director. The market

survey was thus carried out by the Marketing and Dissemination Office of NWREL. A new director was appointed to complete the grant activities and to carry out planning activities for Phase II. The new director (pro tem), Judith Edwards, is a former staff member of the Computer Technology Program who was a primary author of the Selecting and Specifying materials, and will (if approved by NIE) be responsible for phase II of the grant, should it be awarded.

ACTIVITIES PLANNED FOR NEXT REPORTING PERIOD

This is the final progress report for Phase I.

For Phase II activities, see A Proposal for Computer Applications Project, Phase II, August 31, 1976.

Blair P. Worthen
Signature of Principal Investigator

August 31, 1976
Date

APPENDIX A

MARKETING PLAN(S) PREPARATION

FOR

COMPUTER TECHNOLOGY PRODUCTS

MARKETING PLAN(S) PREPARATION
FOR COMPUTER TECHNOLOGY PRODUCTS

The Laboratory, in carrying out product publication and marketing, will be concerned with accomplishing the following objectives:

- In general terms, to provide project staff, the Northwest Regional Educational Laboratory and NIE with guidance and expectations as to how the computer training products Data Management and Decision Making and Selecting and Specifying Computer-Enhanced Units will move out of the developmental process and into user settings.

- In specific terms, through the creation and use of marketing plans, to provide direction relative to publication and marketing of the products, including concerns for:
  - Product identification
  - Marketing identification
  - Promotion methodology
  - Product manufacturing and distribution
  - Product pricing

Two Distinct Products/Two Plans

We are working with two distinct products here. For the most part, each speaks to the needs of different audiences which have different levels of commitment and competence for computer training and use; which are located in different educational settings; and which have different sources and levels of funds for materials. Also, the products appear to

be at different stages in development, indicating the need for different timetables for treatment and publication of each.

Accordingly, we have prepared a separate marketing plan for each product. The comprehensive plan for Data Management and Decision Making is outlined in Section I; Selecting and Specifying Computer-Enhanced Units is outlined in Section II. These plans designed for quick reference are outlined in the charts on pages 20 and 38.

SECTION I

A (WORKING) MARKETING PLAN

FOR DATA MANAGEMENT AND DECISION MAKING

A. PRODUCT IDENTIFICATION

The product line for Data Management and Decision Making is planned to consist of the following pieces:

1. Primary Unit (Data Management and Decision Making) with these component parts:
   - Operations Research in Education
   - PERT/CPM: A Planning and Analysis Tool
   - Linear Programming
   - Queueing Theory
   - Computer Simulation
2. Program listings (possibly with tapes)
3. Instructor guide/supplement

Design alternatives, including formatting and packaging of the product, include:

- Hard-bound; 8½" x 11"; 7" x 10"
- Soft-bound; 8½" x 11"; 7" x 10"
- Skinwrapped; 3-hole punched (unbound); 8½" x 11" to fit common notebook
- A combination of the above
- Typeset or typed copy (using IBM Selectric type for ease of reading)
- Formatted as a manual for ease of use and reference
- Comb bound; perfect; saddlestitch, or Velo

Product configuration may range from one piece to as many as seven separate pieces, depending on how the program listings and instructor guide will be designed and packaged.

B. MARKET(S) IDENTIFICATION

Outcomes of the market survey confirm the identification of certain target user audiences for Data Management and Decision Making. This input also provides us with enough information to project (generally) what purchase/usage level per product we might expect from each audience. Also, from our extensive work in education and computer technology, supplemented by further research (e.g., user panel reviews, telephone surveys), we can identify other probable user audiences and their purchase/usage levels.

It is important for marketing planning to segment user audiences into two distinct categories. First, identify perceived and known primary users. Second, to ensure providing the product to all informed/interested groups, we must identify secondary or special users. Also, it is vital to identify those groups known as linkage agencies who participate as "influencers" in user purchase/use of the product.

Primary User Audiences

Based on known information (survey results, for example) and through the application of practical assumptions, the following categories of audiences are identifed as expected primary users of Data Management and Decision Making:

- Professors of educational administration (to acquaint their students with the computer, specifically its applicability to use in management and decision making tasks)

- Professors of business administration (to acquaint their students with the computer, specifically its applicability to use in management and decision making tasks)
- Superintendents of large school districts (to acquaint school administrators with the computer and its usefulness in management and decision making)

Secondary User Audiences

It is also reasonable to identify secondary (or special) users. These will include the following:

- Acquisitions librarians in large school districts
- Acquisitions librarians in two-year colleges
- Acquisitions librarians in four-year colleges
- Pertinent departments (other than listed as primary users) at two-year and four-year colleges (e.g., mathematics, general sciences, social studies)
- Special interest groups (corporations and governmental agencies providing inservice training)
- Superintendents of small school districts

Linkage Agencies

Groups expected to link the product publisher with users and thereby influence product purchase and use may be identified as linkage agencies. These will include the following:

- Appropriate associations (AASA, NEA, AMA, DPMA, AEDS, others)

- National Institute of Education
- State departments of education
- Area or regional education agencies
- Commercial computer companies (both for hardware and software)

Strategies for Additional Market Identification

It should not be interpreted from the above comments that these lists of markets and linkers are conclusive. There are certainly others. Identification of these should occur through application of those strategies outlined in Table 1.

TABLE 1: STRATEGIES FOR IDENTIFYING TARGET (USER) AUDIENCES AND LINKAGE AGENCIES
(For Data Management and Decision Making)

Sources of Information (Areas to Search)	Procedures for Identification	Expected Outcomes Useful to Marketing
Commercial publishers concerned with the publication of computer training materials (e.g., Prentice-Hall in New Jersey, University of California Press in Los Angeles, etc.)	Review and analyze available published materials. Communicate with contacts at publishing houses to evaluate levels and geographic areas of growth for educational publications. Review publisher sources (e.g., textbooks in print, publisher trade lists annual, ALA booklist, Library Journal, etc.).	Contact with commercial publishers will provide insight relative to the marketing of materials for computer training, on both national and statewide levels. Patterns of interest will result, valuable to our targeting efforts. Publishers will provide a sense of the market and of current and anticipated trends.
Utilizing state, regional and national education contacts of the Northwest Regional Educational Laboratory	Consult with computer technology staff, and review known and anticipated areas of growth relative to computer training at various educational levels (and with a probing into noneducational settings)	The close proximity of such data, as well as the current and ongoing work of the Laboratory, will provide valuable input relative to targeting. Quantitative information on numbers of classrooms, students, teachers, administrators, and other potential users will become available.
Educational Marketing Services (e.g., school marketing services, data market retrieval, etc.)	Acquire names of commercial and noncommercial services. Review their listings of potential targets within secondary and college-level management and teacher training programs.	The review and possible acquisition of such lists provides a strong basis for a nationwide direct mail campaign, timed to reach targeted audiences at peak periods of interest.
Field-based surveys of both management and practicing educators expected/known to be using/interested in materials for computer training	Identify appropriate personnel through such sources as school district and university listings and contact/network results. Design and conduct a survey, and make contact by phone, when necessary.	Such interaction will provide current data useful to marketing, as well as establishing a level of interest among future teachers and administrators in computer training. (The initial survey to measure market potential and market identification has been conducted.)

TABLE 1: STRATEGIES FOR IDENTIFYING TARGET (USER) AUDIENCES AND LINKAGE AGENCIES
(For Data Management and Decision Making)

Sources of Information (Areas to Search)	Procedures for Identification	Expected Outcomes Useful to Marketing
Literature--national, regional, state, and local--which focuses on computer training (e.g., periodicals like Curriculum Product Review, Teacher, dissemination center directories, state education department newsletters, Education Daily, and bibliographies which focus on publishers of computer training materials and topics)	The Information Center at NWREL has access to libraries and other data bases useful in searching for literature relative to computer training. Published literature will be researched or collected from national, regional, state, and local levels.	This search will provide trends and patterns relative to (1) new attention to computer training by publishers, (2) the kinds of subject matter contained in such literature, and (3) sources generating bibliographies and lists (e.g., American Library Association).
Utilize national contacts of NWREL with manufacturers of computer equipment who share an interest in education (e.g., Hewlett-Packard, Digital Equipment Corporation)	Consult with known contacts in private industry to identify interests and directions relative to their attention to computer training, publishing and marketing of materials, locations/identification of users, etc.	Such contact will result in a trend, expressing interest in computer technology training in both education and noneducation markets. Identification of user targets/levels of publication will emerge.
Computer retrieval data bases	Check computer-assisted training abstracts, dissertation abstracts, and ERIC files.	Emerging from this information will be key sites, names, institutions, and curriculum projects related to computer training (and thus probable users and linkage agencies for the products).

TABLE 1: STRATEGIES FOR IDENTIFYING TARGET (USER) AUDIENCES AND LINKAGE AGENCIES
(For Data Management and Decision Making)

Sources of Information (Areas to Search)	Procedures for Identification	Expected Outcomes Useful to Marketing
Associations interested in pre-service and inservice computer education, including: • University Council for Educational Administration • National Education Assn. • Association for Educational Data Systems • American Association of School Administrators • National Conference of Professors of Educational Administration • American Management Assn. • Data Processing Management Assn. • National Business Education Assn. • Association for Development of Computer-Based Instructional Systems	Consult with Computer Technology staff who have relationships with national, regional, and local associations, which are concerned with computer education. Search through NWREL's Information Center for listings of other groups. Consult with individual educators and existing networks.	Such consultation will provide input as to levels of interest and need among identified audiences, where they are located, who they are, and how they can be reached. Trends will form, as will numbers of probable users.

C. PROMOTIONAL METHODOLOGY

Those tasks involved in all phases of product promotion may be categorized as either prepublication or postpublication. The Laboratory's marketing experience indicates that product purchase and use take place in two linear phases: (1) generating awareness and interest, and (2) meeting that interest through production completion, sale and distribution. The awareness phase then may be started early (even before publication) and continued throughout the life of the product.

Prepublication Strategies

Generation of product awareness and building of interest in and commitment to the product should occur prior to final development. In fact, our nationwide survey conducted to identify markets and expected product usage patterns was designed in part as a promotional strategy: (1) alerting probable users through our survey to product inprocess development, and (2) inviting them to submit names/addresses to be kept informed.

There are a number of different approaches to prepublication of the product. Table 3 outlines a set of recommended promotional strategies, selected because of expected effectiveness, yet with an eye to minimizing costs. Certainly more aggressive and costly approaches can be substituted or added, but on the basis of selection criteria (ability to reach users and linkers, build awareness and generate a commitment to the product), this approach should be productive.

Postpublication Strategies

Promotional or awareness activities will be continued throughout and after development and publication of the product. It seems premature at this time to outline specifically what these will be. However, it is expected that such postpublication strategies will include a marriage of some of the alternatives listed in Table 2 (some being a continuation of the prepublication strategies). Advantages and disadvantages for each strategy are listed.

TABLE 2: ALTERNATIVE PREPUBLICATION PROMOTIONAL STRATEGIES

Promotional Strategy	Advantages for Using Strategy	Disadvantages for Using Strategy
Prepare descriptive literature and mail to primary users, secondary users and linkage agencies	• Effective in targeting user audiences and linkage agencies • Ease of control • Cost effective • Invites response • Can be timed for effective promotion • Minimizes personnel involvement	• Message is carried on paper and is dependent on gaining user attention over other mail • Lists require updating to be effective
Submit press releases and product reviews to selected national, state, and local educational newsletters, education associations, and appropriate professional journals	• Inexpensive • Effective as a quasi-testimonial • Can target appropriate channels • Limited personnel involvement • Support direct mail and other strategies	• Dependent on publisher cooperation • Loss of marketing control and timing • Dependent on gaining reader attention
Present programs and exhibits at appropriate national and state educational conferences	• Provides face-to-face interaction with potential users • Presentations are relatively inexpensive • Can receive instant user reaction • Provides large group exposure	• Can be time consuming • Dependent on potential user attendance at the conference • Limited exposure compared to other strategies • Can be expensive to rent space for exhibits
Gain educational television exposure on programs focusing on the role of the computer in data management and decision making	• No expense other than personnel time • Effective, impressionable, timely • Invites immediate viewer response • Reaches numerous viewers	• Often directed to a mass audience rather than targeted one • Usually a one-time impression • Depends on television staff invitation

Promotional Strategy	Advantages for Using Strategy	Disadvantages for Using Strategy
Communicate product availability via existing marketing networks (including laboratories and centers)	• Minimal cost investment • Proven effective in communications • Direct message to targeted audiences • Carries sense of testimonial	• Timing and marketing control may be lost • Message often sent among others • Usually a one-time exposure • Dependent on others not as knowledgeable about the product
Place ads in selected professional journals, both national and regional	• Attention getting • Targeted to identified user/readers • Timing can be controlled • Can support or be supported by other strategies	• Expensive • Often reaches nonusers • Depends on user attention to journal and ad • Requires graphic skills to prepare
Prepare articles for submission to selected education journals focusing on catalog need and value to user groups	• Writing time is the only expense • Effective in building good image of product • Can target users through selected journals • Invites reader response • Effective in supporting other strategies • Article can be reprinted for promotional use	• Dependent on journal acceptance of the article • Developer loses control of time • Journal may edit and weaken article • Not in itself an effective motivator for use of the catalog
Educational Resources Information Center (ERIC)	• Inexpensive • Provides documents in either microfiche or soft copy • More school districts are using microfiche readers • Microfiche are available on loan basis, minimizing school investment • ERIC collection is seen as the most current resource in education • ERIC system is currently under study for improvement to better reach the practitioner	• ERIC system has been used mostly by researchers, not by practitioners • Many libraries in school districts do not know about ERIC • Questionable quality control in screening entries into the ERIC system • Timing and use depends on user action

TABLE 3: RECOMMENDED PREPUBLICATION PROMOTIONAL STRATEGIES

PREPUBLICATION STRATEGIES	SUPPORTIVE COMMENTARY
• Utilize existing communications networks (e.g., CEDaR, state education agencies, University Council for Educational Administration, computer associations, American Management Association, American Association of School Administrators, NWREL network)	This "system of strategies" is designed to provide effective promotion during product development while at the same time minimizing prepublication costs. Also, these individual strategies tend to work well together and as a supplement to promotion accomplished during collection of survey data. Thus, it combines into an effective plan for (1) identifying users and linkers, (2) reaching both groups, and (3) building awareness, interest, purchase and use of the product.
• Prepare effective descriptive literature and conduct a targeted direct mail campaign	Utilization of existing both educational and noneducational communications networks is cost effective and rational. Specific attention to those networks focusing on computer applications is appropriate. The conducting of a well-conceived direct mail campaign can be successful in reaching and motivating users and linking agencies. Timing can be controlled, and reasonably accurate mailing lists are available for a fee. Others may exist at no cost.
• Submit articles and publicity releases on the product and inprocess development to identified national, state and local education newsletters, education associations, and professional journals	The "publicity" approach results in creating a quasi-testimonial through the published newsletter or journal. Such strategies are not expensive, yet prove motivational in gaining user response. This refers both to the shorter press releases and reviews as well as the longer (1500 words or more) articles.

D. PRODUCT(S) MANUFACTURING AND DISTRIBUTION

Manufacturing

The production of Data Management and Decision Making will include application of the following tasks:

- Reviewing the prototype
- Final writing/editing
- Authenticating
- Obtaining copyright permissions
- Final Format decisions
- Final layout/graphic design
- Printing first inventory
- Packaging (binding)

It will be important in all phases to keep the user in mind. For example, a perfect bound document is less practical as a manual than is a comb bound product. However, comb binding is more expensive, and such expense would be passed on to the buyer/user. Also, nationally known book manufacturers can print and bind a product much less expensively than can a local printer. (Such printing costs, per our Laboratory experience, vary as much as 300 percent.) The publisher (and manufacturer) then will work toward creation of a final product, having practicality in use, yet minimal costs in production.

Distribution

The selection of a distribution system (or product delivery mechanism) is directly related to the publisher's marketing strengths in reaching users and linkers. A large commercial publisher has the capability of taking orders directly through a field representative; a publisher

such as the Laboratory must deal primarily through direct mail (receiving orders and shipping the product). In all cases, the primary concern will be to select the distribution channel that moves the product from publisher to user in the most efficient manner.

Questions/concerns to be weighed in meeting distribution needs for Data Management and Decision Making include:

- Warehousing (inventory control)
- Receiving/processing orders
- Boxing/wrapping
- Postage/shipping
- Continuation of awareness strategies
- Postpurchase product evaluation
- Servicing/training for product users

E. PRODUCT(S) PRICING

Pricing of Data Management and Decision Making will depend on a number of factors, including:

- Who will publish the product? An R&D laboratory skilled in dissemination/marketing/publishing will be able to maintain a relatively lower price to the user than can a commercial house.
- What quantity (initial inventory) of the product is necessary?
- What are the projected sales of the product over its life cycle?
- What are the prices of like materials for like user audiences?
- What are the budget capabilities of the targeted user/buyer audiences?

As publisher of the product, that process the Laboratory will follow in pricing will include assessment of the following:

- Identification of sales prices of like products for like audiences
- Cost of treatment to prepare products for publication (editing, etc.)
- Cost of manufacturing the product (layout, printing, etc.)
- Cost of promotion for direct sale
- Cost of distribution for direct sale

- Final costing/pricing, including direct costs (above), indirect costs, and any allowances for a markup

Anticipated Price Range

A final price cannot be established until a thorough study of all related costs is completed. However, based on field survey input, some known costs, estimates based on prior publishing experience, and other criteria listed above, the retail price for one copy of Data Management and Decision Making is expected to fall within a range from $7.00 to $10.00 (the income from which will be utilized in a revolving account fashion to rebuild inventories and perform ongoing marketing).

Certainly the Laboratory's desire is to make these materials as readily available as possible to user audiences. This mandate, then, will weigh heavily in final determination of the product selling price.

Prepared 6/25/76

MARKETING PLAN (TENTATIVE)
For Data Management and Decision Making

Product Identification	Market(s) Identification	Promotional Methodology	Manufacturing & Distribution	Pricing Methodology
Alternative designs being considered include a range of from one piece to as many as seven separate pieces. Expected product configuration includes: • Primary piece: Data Management and Decision Making, incorporating up to five components: - Operations Research in Education - PERT/CPM: A Planning and Analysis Tool - Linear Programming - Queueing Theory • Program listings • Instructor supplement Final design, formatting and packaging will look at alternatives such as: • Softbound pieces, either 8½"x11" or 7"x10" • Shrinkwrapped 3-hole punched (nonbound) pieces, 8½"x11" • A combination of these • Typed or typeset copy • Designed in manual format for ease of use • Consider comb binding, perfect, saddle and velo	Market (target user) audiences identified as primary and secondary users. These groups performing the role of purchaser/use influencers to market audiences are identified as linkage agencies. Primary users will be in the role of managers, administrators and trainers of those who perform administrative tasks. These include: • Professors of educational administration • Professors of business administration • Superintendents of large school districts Secondary users will include: • Superintendents of medium and small school districts • Librarians at various levels • Users in private industry • Other departments (e.g., health, sciences) • Governmental agencies Linkage agencies will include: • State education agencies • State, regional and national associations • Intermediate education districts • NIE dissemination network Manner of product use will range from preservice inclass to inservice workshops, depending on specific target audiences.	Promotion strategies will be designed to build awareness among market user audiences and linkage agencies, to gain commitment to the products; to achieve final purchase and use. Promotion will be conducted in two phases—prepublication and postpublication. Prepublication strategies will include: • Communications through existing education and communication networks • Preparation of descriptive product literature • Conducting targeted nationwide direct mail campaign • Submission of product press releases to journals, associations, networks • Submission of articles for publication in targeted user-read journals and newsletters • Conference participation to exhibit product Postpublication strategies under consideration (in addition to above) include: • Use of educational TV and radio • Placement of print ads in target user-read publications (local and national) • ERIC (Educational Resources Information Center) • Sampling among targeted user audiences to judge acceptance	Manufacturing tasks will include: • Final writing/editing • Authenticating • Obtaining copyright permissions • Final layout/design • Final formatting • Packaging-binding • Printing initial inventory Distribution (delivery) tasks will include all activities in moving product from publisher to user, including: • Warehousing (inventory control) • Receiving/processing orders • Boxing/wrapping • Postage/shipping • Continuation of awareness strategies • Postpurchase product evaluation • Servicing/training for product users The Laboratory, as publisher, will normally receive orders via mail and telephone. Resulting delivery to user is via mail.	Pricing will be designed to (1) recover investment costs, yet (2) offer a reasonably priced product based on user budget capabilities. Final pricing will depend on: • Inventory of the product • Projected unit sales • Prices of like (if any) materials • User budget capabilities • Cost of final treatment • Cost of product manufacturing/distribution • Cost of promotion • Inclusion of all direct and indirect costs to recover investment Consideration will be given to multiple pricing strategies, such as: • Selling the primary piece, offering program listings and instructor supplement at no cost • Selling the primary piece and program listing, offering the instructor supplement at no cost • Selling all pieces, either as a package or as individual units Discounts on multiple orders will be available.

SECTION II

A (WORKING) MARKETING PLAN FOR SELECTING AND SPECIFYING COMPUTER-ENHANCED UNITS

A. PRODUCT IDENTIFICATION

The product line for Selecting and Specifying Computer-Enhanced Units is planned to consist of the following pieces:

1. Primary Unit (Selecting and Specifying Computer-Enhanced Units) with these component parts:
   - The Roles of the Computer in Instruction
   - Hardware at a Glance
   - Software at a Glance
   - How to Select Units
   - Computers in the Curriculum: A Book of Readings
2. CRIMEX
3. Program Listings (possibly with tapes)
4. Instructor Guide (supplement)

Design alternatives, including formatting and packaging of the product, include:

- Hard bound; 8½" x 11"; 7" x 10"
- Soft bound; 8½" x 11"; 7" x 10"
- Skinwrapped; 3-hole punched (unbound); 8½" x 11" to fit common notebook
- A combination of the above
- Typeset or typed copy (using IBM Selectric type for ease of reading)
- Formatted as a manual for ease of use and reference
- Comb bound; perfect; saddle stitch, or Velo

Product configuration may range from two pieces to as many as eight separate pieces, depending on how CRIMEX, the program listings, and instructor guide will be designed and packaged.

B. MARKET(S) IDENTIFICATION

Outcomes of the market survey confirm the identification of certain target user audiences for Selecting and Specifying Computer-Enhanced Units. This input also provides us with enough information to project (generally) what purchase/usage level per product might be expected from each audience. Also, from our extensive work in education and computer technology, supplemented by further research (e.g., user panel reviews, telephone surveys), we can identify other probable user audiences and their purchase/usage levels.

It is important for marketing planning to segment user audiences into two distinct categories. First, identify perceived and known primary users. Second, to ensure providing the product to all informed/interested groups, we must identify secondary or special users. Also, it is vital to identify those groups known as linkage agencies who participate as "influencers" in user purchase/use of the product.

Primary User Audiences

Based on known information (survey results, for example) and through the application of practical assumptions, the following categories of audiences are identified as expected primary users of the product:

- Professors of teacher education (to acquaint their students with the computer; its applicability for use in instruction and role in society)

- Teachers of science (junior high and secondary)
- Teachers of mathematics (junior high and secondary)
- Teachers of business education (secondary)
- Superintendents of smaller school districts (to acquaint school administrators with the computer, its role in society and usefulness in instruction)

Secondary User Audiences

It is also reasonable to identify secondary (or special) users. These will include the following:

- Teachers of social studies (junior high and secondary)
- Teachers of vocational education (secondary)
- Teachers on the elementary level
- Acquisitions librarians in large school districts
- Acquisitions librarians in smaller school districts
- Acquisitions librarians in two-year colleges
- Acquisitions librarians in four-year colleges
- Pertinent departments (other than in teacher education) at two-year and four-year colleges (e.g., mathematics, general sciences, social studies)
- Special interest groups (corporations and governmental agencies providing inservice training)
- Commercial computer agencies

Linkage Agencies

Groups expected to link the product publisher with users and thereby influence product purchase and use may

be identified as linkage agencies. These will include the following:

- Appropriate associations (NEA, AFTA, AEDS, NAUCAL, ADCIS, ACM, others)
- National Institute of Education (dissemination network)
- State departments of education
- Area or regional education agencies
- Commercial computer agencies

Strategies for Additional Market Identification

It should not be interpreted from the above comments that these lists of markets and linkers are conclusive. There are certainly others. Identification of these should occur through application of those strategies outlined in Table 4.

TABLE 4: STRATEGIES FOR IDENTIFYING TARGET (USER) AUDIENCES AND LINKAGE AGENCIES
(For Selecting and Specifying Computer-Enhanced Units)

Sources of Information (Areas to Search)	Procedures for Identification	Expected Outcomes Useful to Marketing
Commercial publishers concerned with the publication of computer training materials (e.g., Prentice-Hall in New Jersey, University of California Press in Los Angeles, etc.)	Review and analyze available published materials. Communicate with contacts at publishing houses to evaluate levels and geographic areas of growth for educational publications. Review publisher sources (e.g., textbooks in print, publisher trade lists annual, ALA booklist, Library Journal, etc.).	Contact with commercial publishers will provide insight relative to the marketing of materials for computer training, on both national and statewide levels. Patterns of interest will result, valuable to our targeting efforts. Publishers will provide a sense of the market and of current and anticipated trends.
Utilizing state, regional and national education contacts of the Northwest Regional Educational Laboratory	Consult with computer technology staff, and review known and anticipated areas of growth relative to computer training at various educational levels (and with a probing into noneducational settings)	The close proximity of such data, as well as the current and ongoing work of the Laboratory, will provide valuable input relative to targeting. Quantitative information on numbers of classrooms, students, teachers, administrators, and other potential users will become available.
Educational Marketing Services (e.g., school marketing services, data market retrieval, etc.)	Acquire names of commercial and noncommercial services. Review their listings of potential targets within elementary, secondary and college-level teacher training programs.	The review and possible acquisition of such lists provides a strong basis for a nationwide direct mail campaign, timed to reach targeted audiences at peak periods of interest.
Field-based surveys of both management and practicing educators expected/known to be using/interested in materials for computer training	Identify appropriate personnel through such sources as school district and university listings and contact/network results. Design and conduct a survey, and make contact by phone, when necessary.	Such interaction will provide current data useful to marketing, as well as establishing a level of interest among future teachers and administrators in computer training. (The initial survey to measure market potential and market identification has been conducted.)

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(For Selecting and Specifying Computer-Enhanced Units)

Sources of Information (Areas to Search)	Procedures for Identification	Expected Outcomes Useful to Marketing
Literature--national, regional, state, and local--which focuses on computer training (e.g., periodicals like Curriculum Product Review, Teacher, dissemination center directories, state education department newsletters, professional association newsletters and journals, Education Daily and bibliographies which focus on publishers of computer training materials and topics)	The Information Center at NWREL has access to libraries and other data bases useful in searching for literature relative to computer training. Published literature will be researched or collected from national, regional, state, and local levels.	This search will provide trends and patterns relative to (1) new attention to computer training by publishers, (2) the kinds of subject matter contained in such literature, and (3) sources generating bibliographies and lists (e.g., American Library Association).
Utilize national contacts of NWREL with manufacturers of computer equipment who share an interest in education (e.g., Hewlett-Packard, Digital Equipment Corporation)	Consult with known contacts in private industry to identify interests and directions relative to their attention to computer training, publishing and marketing of materials, locations/identification of users, etc.	Such contact will result in a trend, expressing interest in computer technology training in both education and noneducation markets. Identification of user targets/levels of publication will emerge.
Computer retrieval data bases	Check computer assisted training abstracts, dissertation abstracts, and ERIC files.	Emerging from this information will be key sites, names, institutions, and curriculum projects related to computer training (and thus probable users and linkage agencies for the products).

TABLE 4: STRATEGIES FOR IDENTIFYING TARGET (USER) AUDIENCES AND LINKAGE AGENCIES
(For Selecting and Specifying Computer-Enhanced Units)

Sources of Information (Areas to Search)	Procedures for Identification	Expected Outcomes Useful to Marketing
Associations interested in pre-service and inservice computer education, including: • American Association of Colleges for Teacher Education • University Council for Educational Administration • National Education Assn. • National Association of Users of Computer Applications to Learning • Association for Educational Data Systems • National Mathematics Assn. • National Conference of Professors of Teacher Administration • American Management Assn. • National Business Education Assn. • Association for Development of Computer-Based Instructional Systems	Consult with Computer Technology staff who have relationships with national, regional, and local associations, which are concerned with computer education. Search through NWREL's Information Center for listings of other groups. Consult with individual educators and existing networks.	Such consultation will provide input as to levels of interest and need among identified audiences, where they are located, who they are, and how they can be reached. Trends will form, as will numbers of probable users.

C. PROMOTIONAL METHODOLOGY

Those tasks involved in all phases of product promotion may be categorized as either prepublication or postpublication. The Laboratory's marketing experience indicates that product purchase and use take place in two linear phases: (1) generating awareness and interest, and (2) meeting that interest through product completion, sale and distribution. The awareness phase then may be started early (even before publication) and continued throughout the life of the product.

Prepublication Strategies

Generation of product awareness and building of interest in and commitment to the product should occur prior to final development. In fact, our nationwide survey conducted to identify markets and expected product usage patterns was designed in part as a promotional strategy: (1) alerting probable users through our survey to product inprocess development, and (2) inviting them to submit names/addresses to be kept informed.

There are a number of different approaches to prepublication of the product. Table 6 outlines a set of recommended promotional strategies, selected because of expected effectiveness, yet with an eye to minimizing costs. Certainly more aggressive and costly approaches can be substituted or added, but on the basis of selection criteria (ability to reach users and linkers, build awareness and generate a commitment to the product), this approach should be productive.

Postpublication Strategies

Promotional or awareness activities will be continued throughout and after development and publication of the product. It seems premature at this time to outline specifically what these will be. However, it is expected that such postpublication strategies will include a marriage of some of the alternatives listed in Table 5 (some being a continuation of the prepublication strategies). Advantages and disadvantages for each strategy are listed.

TABLE 5: ALTERNATIVE PREPUBLICATION PROMOTIONAL STRATEGIES

Promotional Strategy	Advantages for Using Strategy	Disadvantages for Using Strategy
Prepare descriptive literature and mail to primary users, secondary users and linkage agencies	• Effective in targeting user audiences and linkage agencies • Ease of control • Cost effective • Invites response • Can be timed for effective promotion • Minimizes personnel involvement	• Message is carried on paper and is dependent on gaining user attention over other mail • Lists require updating to be effective
Submit press releases and product reviews to selected national, state, and local educational newsletters, education associations, and appropriate professional journals	• Inexpensive • Effective as a quasi-testimonial • Can target appropriate channels • Limited personnel involvement • Support direct mail and other strategies	• Dependent on publisher cooperation • Loss of marketing control and timing • Dependent on gaining reader attention
Present programs and exhibits at appropriate national and state educational conferences	• Provides face-to-face interaction with potential users • Presentations are relatively inexpensive • Can receive instant user reaction • Provides large group exposure	• Can be time consuming • Dependent on potential user attendance at the conference • Limited exposure compared to other strategies • Can be expensive to rent space for exhibits
Gain educational television exposure on programs focusing on the role of the computer in data management and decision making	• No expense other than personnel time • Effective, impressionable, timely • Invites immediate viewer response • Reaches numerous viewers	• Often directed to a mass audience rather than targeted one • Usually a one-time impression • Depends on television staff invitation

Promotional Strategy	Advantages	Disadvantages
Communicate product availability via existing marketing networks (including laboratories and centers)	• Minimal cost investment • Proven effective in communications • Direct message to targeted audiences • Carries sense of testimonial	• Timing and marketing control may be lost • Message often sent among others • Usually a one-time exposure • Dependent on others not as knowledgeable about the product
Place ads in selected professional journals, both national and regional	• Attention getting • Targeted to identified user/readers • Timing can be controlled • Can support or be supported by other strategies	• Expensive • Often reaches nonusers • Depends on user attention to journal and ad • Requires graphic skills to prepare
Prepare articles for submission to selected education journals focusing on catalog need and value to user groups	• Writing time is the only expense • Effective in building good image of product • Can target users through selected journals • Invites reader response • Effective in supporting other strategies • Article can be reprinted for promotional use	• Dependent on journal acceptance of the article • Developer loses control of time • Journal may edit and weaken article • Not in itself an effective motivator for use of the catalog
Educational Resources Information Center (ERIC)	• Inexpensive • Provides documents in either microfiche or soft copy • More school districts are using microfiche readers • Microfiche are available on loan basis, minimizing school investment • ERIC collection is seen as the most current resource in education • ERIC system is currently under study for improvement to better reach the practitioner	• ERIC system has been used mostly by researchers, not by practitioners • Many libraries in school districts do not know about ERIC • Questionable quality control in screening entries into the ERIC system • Timing and use depends on user action

TABLE 6: RECOMMENDED PREPUBLICATION PROMOTIONAL STRATEGIES

PREPUBLICATION STRATEGIES	SUPPORTIVE COMMENTARY
• Utilize existing communications networks (e.g., CEDaR, state education agencies, NEA, computer associations, American Management Association, American Association of Colleges for Teacher Education, NWREL network)	This "system of strategies" is designed to provide effective promotion during product development while at the same time minimizing prepublication costs. Also, these individual strategies tend to work well together and as a supplement to promotion accomplished during collection of survey data. Thus, it combines into an effective plan for (1) identifying users and linkers, (2) reaching both groups, and (3) building awareness, interest, purchase and use of the product.
• Prepare effective descriptive literature and conduct a targeted direct mail campaign	Utilization of existing both educational and noneducational communications networks is cost effective and rational. Specific attention to those networks focusing on computer applications is appropriate.
• Submit articles and publicity releases on the product and inprocess development to identified national, state and local education newsletters, education associations, and professional journals	The conducting of a well-conceived direct mail campaign can be successful in reaching and motivating users and linking agencies. Timing can be controlled, and reasonably accurate mailing lists are available for a fee. Others may exist at no cost. The "publicity" approach results in creating a quasi-testimonial through the published newsletter or journal. Such strategies are not expensive, yet prove motivational in gaining user response. This refers both to the shorter press releases and reviews as well as the longer (1500 words or more) articles.

D. PRODUCT(S) MANUFACTURING & DISTRIBUTION

Manufacturing

The production of Selecting and Specifying Computer-Enhanced Units will include application of the following tasks:

- Reviewing the prototype
- Final writing/editing
- Authenticating
- Obtaining copyright permissions
- Making final format decisions
- Final layout/graphic design
- Printing first inventory
- Packaging (binding)

It will be important in all phases to keep the user in mind. For example, a perfect bound document is less practical as a manual than is a comb bound product. However, comb binding is more expensive, and such expense would be passed on to the buyer/user. Also, nationally known book manufacturers can print and bind a product much less expensively than can a local printer. (Such printing costs, per our Laboratory experience, vary as much as 300 percent.) The publisher (and manufacturer) then will work toward creation of a final product, having practicality in use, yet minimal costs in production.

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The selection of a distribution system (or product delivery mechanism) is directly related to the publisher's marketing strengths in reaching users and linkers. A large commercial publisher has the capability of taking orders directly through a field representative; a publisher such as

the Laboratory must deal primarily through direct mail (receiving orders and shipping the product). In all cases, the primary concern will be to select the distribution channel that moves the product from publisher to user in the most efficient manner.

Questions/concerns to be weighed in meeting distribution needs for the product include:

- Warehousing (inventory) control
- Receiving/processing orders
- Boxing/wrapping
- Postage/shipping
- Continuation of awareness strategies
- Postpurchase product evaluation
- Servicing/training for product users

E. PRODUCT(S) PRICING

Pricing of Selecting and Specifying Computer Enhanced-Units will depend on a number of factors, including:

- Who will publish the product? An R&D laboratory skilled in dissemination/marketing/publishing will be able to maintain a relatively lower price to the user than can a commercial house.
- What quantity (initial inventory) of the product is necessary?
- What are the projected sales of the product over its life cycle?
- What are the prices of like materials for like user audiences?
- What are the budget capabilities of the targeted user/buyer audiences?

As the publisher of the product, that process the Laboratory will follow in pricing will include assessment of the following:

- Identification of sale prices of like product for like audiences
- Cost of treatment to prepare products for publication (editing, etc.)
- Cost of manufacturing the product (layout, printing, etc.)
- Cost of distribution for direct sale
- Final costing/pricing, including direct costs (above), indirect costs, and any allowances for a markup

Anticipated Price Range

A final price cannot be established until a thorough study of all related costs is completed. However, based on field survey input, some known costs, estimates based on prior publishing experience, and other criteria listed above, the retail price for one copy of the product is expected to fall within a range from $7.00 to $12.00 (the income from which will be utilized in a revolving account fashion to rebuild inventories and perform ongoing marketing).

Certainly the Laboratory's desire is to make these materials as readily available as possible to user audiences. This mandate, then, will weigh heavily in final determination of the product selling price.

Prepared 9/23/76

MARKETING PLAN (TENTATIVE)
For Selecting and Specifying Computer-Enhanced Units

Product Identification	Market(s) Identification	Promotional Methodology	Manufacturing & Distribution	Pricing Methodology
Alternative designs being considered include a range from two pieces to as many as eight separate pieces. Expected product configuration includes: • Primary piece: Selecting and Specifying Computer Enhanced Units, incorporating up to five components: - The Roles of the Computer in Instruction - Hardware at a Glance - Software at a Glance - Computers in the Curriculum: A Book of Readings - How to Select Units • Program listings • CHOICE • Instructor's supplement Special product line configuration will consider which, if any, of the five primary components could stand alone (for wider market potential). Final design, formatting and packaging will look at alternatives such as: • Softbound pieces, either 8½"x11" or 7"x10" • Shrinkwrapped 3-hole punched (unbound) pieces, 8½"x11" • A combination of these • Typed or typeset copy • Designed in manual format for ease of use • Consider comb binding, perfect, saddle and velo	Market (target user) audiences are identified as primary and secondary users. These groups performing the role of purchaser/user influencers are identified as linkage agencies. Primary users will be in the role of teachers, supervisors and trainers of those who perform teaching tasks. These include: • Professors of teacher education • Teachers of social sciences (secondary) • Teachers of math (intermediate and secondary) • Teachers of science (intermediate and secondary) • Superintendents of large school districts Secondary users will include: • Superintendents of medium and small school districts • Teachers of vocational education (secondary) • Teachers of social studies (intermediate) • Teachers of business education (secondary) • Elementary teachers • Users in private industry Linkage agencies will include: • State education agencies • State, regional and national associations • Intermediate education agencies • NIE dissemination network Manner of product use will range from preservice inclass to inservice workshops, depending on specific target audiences.	Promotion strategies will be designed to build awareness among market user audiences and linkage agencies; to gain commitment to the products; to achieve final purchase and use. Promotion will be conducted in two phases--prepublication and postpublication. Prepublication strategies will include: • Communications through existing education and communication networks • Preparation of descriptive product literature • Conducting targeted nationwide direct mail campaign • Submission of product press releases to journals, associations, networks • Submission of articles for publication in targeted user-read journals and newsletters • Conference participation to exhibit product Postpublication strategies under consideration (in addition to above) include: • Use of educational TV and radio • Placement of print ads in target user-read publications (local and national) • ERIC (Educational Resources Information Center) • Sampling among targeted user audiences to judge acceptance	Manufacturing tasks will include: • Final writing/editing • Authenticating • Obtaining copyright permissions • Final layout/design • Final formatting • Packaging-binding • Printing initial inventory Distribution (delivery) tasks will include all activities in moving product from publisher to user, including: • Warehousing (inventory control) • Receiving/processing orders • Boxing/wrapping • Postage/shipping • Continuation of awareness strategies • Postpurchase product evaluation • Servicing/training for product users The Laboratory, as publisher, will normally receive orders via mail and telephone. Resulting delivery to user is via mail.	Pricing will be designed to (1) recover investment costs, yet (2) offer a reasonably priced product based on user target capabilities. Final pricing will depend on: • Inventory of the product • Projected unit sales • Price of like (if any) materials • User budget capabilities • Cost of final treatment • Cost of product manufacturing/distribution • Cost of promotion • Inclusion of all direct and indirect costs to cover investment Consideration will be given to multiple pricing strategies, such as: • Selling the primary piece, offering program listings and instructor supplement at no cost • Selling the primary piece and program listing, offering the instructor supplement at no cost • Selling all pieces, either as a package or as individual units Discounts on multiple orders will be available.

APPENDIX B

MARKET SURVEY

- Letters
- Instruments
- Universe Data
- Summaries by Population Surveyed
- Representative Comments
- Letters from Respondents

Northwest
Regional
Educational
Laboratory

710 S.W. Second Avenue • Portland, Oregon 97204 • Telephone (503) 248-6800

July 9, 1976

Dear Colleague:

The Laboratory is developing materials for training teachers and students in teacher education to use computers as an aid to instruction. You have been selected to assist in determining the potential value and need which selected educators across the country see for such materials.

We would appreciate it if you or an appropriate staff member would complete the enclosed questionnaire to provide us with information to guide further work in creating appropriate training materials which have a high potential for being used. The Laboratory is carrying out this work under a contract with the National Institute of Education.

Because of the short time available to us for this study, your quick response will be most valuable. A postage-paid return envelope is included. Upon request, we would be happy to send you a copy of the survey results.

Thank you for your help.

Sincerely,

Lawrence D. Fish

Lawrence D. Fish
Executive Director

LDF:cc

Encl. - 1

Northwest
Regional
Educational
Laboratory

710 S.W. Second Avenue • Portland, Oregon 97204 • Telephone (503) 248-6800

July 9, 1976

Dear Colleague:

The Laboratory is developing materials for training teachers and students in teacher education to use computers as an aid to instruction. You have been selected to assist in determining the potential value and need for such materials for preservice and inservice courses.

We would appreciate it if you or an appropriate staff member would complete the enclosed questionnaire to provide us with information to guide further work in creating appropriate training materials which have a high potential for being used. The Laboratory is carrying out this work under a contract with the National Institute of Education.

Because of the short time available to us for this study, your quick response will be most valuable. A postage-paid return envelope is included. Upon request, we would be happy to send you a copy of the survey results.

Thank you for your help.

Sincerely,

Lawrence D. Fish

Lawrence D. Fish
Executive Director

LDF:cc

Encl. - 1

Northwest
Regional
Educational
Laboratory

710 S.W. Second Avenue • Portland, Oregon 97204 • Telephone (503) 248-6800

July 9, 1976

Dear Colleague:

The Laboratory is developing materials for training teachers and administrators to use computers for various administrative tasks and as an aid to instruction. You have been selected to assist in determining the potential value and need which superintendents see for such materials.

We would appreciate it if you or an appropriate staff member would complete the enclosed questionnaire to provide us with information to guide further work in creating appropriate training materials which have a high potential for being used. The Laboratory is carrying out this work under a contract with the National Institute of Education.

Because of the short time available to us for this study, your quick response will be most valuable. A postage-paid return envelope is included. Upon request, we would be happy to send you a copy of the survey results.

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Sincerely,

Lawrence D. Fish

Lawrence D. Fish
Executive Director

LDF:cc

Encl. - 1

Northwest
Regional
Educational
Laboratory

710 S.W. Second Avenue • Portland, Oregon 97204 • Telephone (503) 248-6800

July 9, 1976

Dear Colleague:

The Laboratory is developing materials for training practicing school administrators and educational administration students to use computers for various school management and decision making tasks. You have been selected to assist in determining the potential value and need for such materials in educational administration courses.

We would appreciate it if you or an appropriate staff member would complete the enclosed questionnaire to provide us with information to guide further work in creating appropriate training materials which have a high potential for being used. The Laboratory is carrying out this work under a contract with the National Institute of Education.

Because of the short time available to us for this study, your quick response will be most valuable. A postage-paid return envelope is included. Upon request, we would be happy to send you a copy of the survey results.

Thank you for your help.

Sincerely,

Lawrence D. Fish

Lawrence D. Fish
Executive Director

LDF:cc

Encl. - 1

Northwest Regional Educational Laboratory
710 S.W. Second Avenue • Portland, Oregon 97204 • Telephone (503) 248-6800

July 9, 1976

Dear Colleague:

The Laboratory is developing materials for training businessmen and women and business administration students to use computers for various management and decision making tasks. You have been selected to assist in determining the potential value and need which professors of business administration see for such materials.

We would appreciate it if you or an appropriate staff member would complete the enclosed questionnaire to provide us with information to guide further work in creating appropriate training materials which have a high potential for being used. The Laboratory is carrying out this work under a contract with the National Institute of Education.

Because of the short time available to us for this study, your quick response will be most valuable. A postage-paid return envelope is included. Upon request, we would be happy to send you a copy of the survey results.

Thank you for your help.

Sincerely,

Lawrence D. Fish

Lawrence D. Fish
Executive Director

LDF:cc

Encl. - 1

SURVEY OF SECONDARY EDUCATION TEACHERS

This survey is designed to obtain teachers' professional advice concerning the needs of teachers in understanding how the computer can be used as an aid to instruction. The information gained is most important for creating appropriate teacher training materials.

1. Which of the following best describes the skill that a teacher in your field should have with computers? (Check any that apply)

   - ○ Ability to use prepackaged programs for simulations and problem solving in instruction 64%
   - ○ Understanding of the workings of computer hardware (equipment needed, capabilities, etc.) 37%
   - ○ Understanding of the social impact and importance of the computer 44%
   - ○ Other (please specify) _____ 7%
   - ○ None 2%

2. Have you ever received training on how to use the computer in instruction? (Check any that apply)

   - ○ Yes, in a college course 22%
   - ○ Yes, in inservice training 14%
   - ○ Yes, by informal reading and/or experience 17%
   - ○ Yes, other (please specify) 4%
   - ○ No, I have had no training 61%

3. Would you consider it useful for your teaching practice to receive more training in the use of the computer in instruction?

   - ○ Yes, in a college or university course 16%
   - ○ Yes, in a district or local inservice program 56%
   - ○ No, because _____ 13%

4. In which of the following areas would you like more training in the use of computers in instruction? (Check any that apply)

   - ○ Understanding of the social impact and importance of the computer 35%
   - ○ Understanding of the workings of computer hardware (equipment needed, capabilities, etc.) 38%
   - ○ Ability to use programs for simulation and problem solving for instruction 71%
   - ○ Other (please specify) _____ 4%
   - ○ None 6%

5. Do you know of any materials for the training of teachers in the above computer instructional categories?

   - ○ Yes, and I am satisfied with the quality 2%
   - ○ Yes, but the materials need improvement 8%
   - ○ Yes, but I don't know their quality 15%
   - ○ No 72%

6. If you would be interested in inservice training (one or two days) for the use of the computer in instruction, when would you prefer it?

   ○ Before school opens in the fall 32% ○ During the school year 54% ○ At the conclusion of the school year 5% ○ Not interested 7%

(continued on reverse side)

7. What is the accessibility of a computer terminal for your instructional use?

○ 15% Very accessible (in school) ○ 31% Somewhat accessible (in or near school) ○ 51% Little or no accessibility (neither in nor near school)

8. If your school does not presently provide for teacher access to computer terminals for instructional purposes, what are the plans for the future?

- ○ Plans to provide computer terminals for teachers 3%
- ○ Possibly will provide computer terminals for teachers 9%
- ○ Definitely is not interested in providing computer terminals for teachers 10%
- ○ I don't know the school's plans 64%

9. If computers are used in instruction at your school, estimate the percentage of teachers in your school who use them in their instructional programs.

○ 48% Fewer than 10% ○ 10% 10% to 25% ○ 40% 25% to 50% ○ 10% More than 50%

10. Which of the following topics about computers do you include in any of your students' courses? (Check any that apply)

- ○ Role of the computer in modern society 35%
- ○ Elements of computer science 12%
- ○ Computer language (FORTRAN, BASIC, etc.) instruction 20%
- ○ Solution of problems with the assistance of the computer 23%
- ○ Other (specify) _____ 6%
- ○ None 40%

11. In what state is your school district located?

12. What is the size of the high school in which you teach?

○ 46% Less than 1,000 ○ 23% 1,000 to 1,500 ○ 25% 1,500 to 2,500 ○ 4% Over 2,500

13. What is your principal area of instruction?

○ 55% Mathematics ○ 2% Science ○ 34% Social Studies ○ 8% Other (please specify)

_____

14. Circle those grade levels you teach.

27% 7 29% 8 47% 9 48% 10 50% 11 50% 12

Thank you again for your assistance. If you wish for us to remain in contact with you after the final development of the materials, fill in your name and address below.

Name _____ Title _____

Institution _____

Business Address _____

If you have any further comments that you feel would help us in the development of useful training materials in this area, please feel free to include them. They are much appreciated.

Return in enclosed postage-paid envelope to:

Office of Marketing and Dissemination
Northwest Regional Educational Laboratory
710 S. W. Second Avenue
Portland, Oregon 97204

SURVEY OF PROFESSORS OF TEACHER EDUCATION

This survey is designed to obtain professional advice concerning the needs in the education of teachers for developing skills in utilizing the computer as an aid to instruction. The information gained is most important for developing appropriate training materials.

1. How important do you consider it to be for classroom teachers to understand the role of the computer in our society?

	Very Important	Somewhat Important	No Importance
Elementary teachers	☐ 47%	☐ 51%	☐ 1%
Junior high teachers	☐ 61.4%	☐ 38.6%	☐ 0%
Secondary teachers	☐ 76.4%	☐ 23.6%	☐ 0%

2. How important is it that teachers at each level indicated below be able to use the computer for classroom instruction for such areas as simulation, problem solving, or storage and retrieval processes?

	Very Important	Somewhat Important	No Importance
Elementary	☐ 12.7%	☐ 62%	☐ 20.6%
Junior high math	☐ 57.5%	☐ 37.8%	☐ 3%
Junior high science	☐ 53.2%	☐ 41.3%	☐ 4%
Junior high social studies	☐ 24.4%	☐ 59.8%	☐ 11.8%
Other junior high classes-- _____	☐ 9.4%	☐ 18.1%	☐ 3.9%
_____	☐	☐	☐
Secondary math	☐ 79.5%	☐ 17.3%	☐ 1%
Secondary science	☐ 76.4%	☐ 20.5%	☐ 1%
Secondary social studies	☐ 40.9%	☐ 48.0%	☐ 6%
Secondary vocational education	☐ 44.4%	☐ 40.5%	☐ 4%
Other secondary classes-- _____	☐ 10%	☐ 12%	☐ 2%
_____	☐	☐	☐

3. Indicate whether training in using the computer in instruction is a part of your undergraduate curriculum, at what level, and if it is required or an elective.

	Not offered	Offered as a separate course	Offered as part of a course	(Check one if offered) Required	Elective
Elementary	☐ 60%	☐ 12%	☐ 9%	☐ 6%	☐ 17%
Secondary math	☐ 33%	☐ 39%	☐ 16%	☐ 26%	☐ 32%
Secondary science	☐ 40%	☐ 27%	☐ 18%	☐ 14%	☐ 32%
Secondary social studies	☐ 52%	☐ 20%	☐ 8%	☐ 7%	☐ 24%
Secondary vocational education	☐ 53%	☐ 10%	☐ 6%	☐ 4%	☐ 11%
Secondary business education	☐ 41%	☐ 24%	☐ 11%	☐ 18%	☐ 18%

(continued on reverse side)

4. Do any of the students of teacher education in the subject areas listed in question 3 have the opportunity to work on computer terminals?

☐ Frequently 22% ☐ Sometimes 44% ☐ Seldom 19% ☐ No 11%

5. What is your projection for the next five years regarding the emphasis your institution will place on training undergraduate and graduate students of teacher education in the use of computers?

☐ Increase very much 17.3% ☐ Increase some 68.5% ☐ No change 13.4% ☐ Decrease some ☐ Decrease very much

6. Are you familiar with training materials to prepare teachers in the use of computers for instruction?

☐ Yes, and they are of satisfactory quality 2%

☐ Yes, but the materials need improvement 17%

☐ Yes, but I don't know their quality 34%

☐ No 46%

7. Are inservice courses for practicing teachers on using computers in the classroom offered by your department?

☐ Yes, frequently 4% ☐ Yes, occasionally 18% ☐ No 77%

8. What is the approximate total enrollment of your university or college?

☐ Less than 1,000 22% ☐ 1,000 to 10,000 60% ☐ 10,000 to 20,000 12% ☐ More than 20,000 6%

9. What is the approximate number of students majoring in educational administration at your school?

_____

10. Of these students, what percentage will have received training in computer utilization for instruction by the conclusion of their program?

_____%

11. Please indicate the state where your college or university is located.

_____

Thank you for your assistance. If you wish for us to remain in contact with you after final development of the materials, fill in your name and address below.

Name _____ Title _____

Institution _____

Business Address _____

If you have any further comments that you feel would help us in the development of useful training materials in this area, please feel free to include them. They are much appreciated.

Return in enclosed postage-paid envelope to:

Office of Marketing and Dissemination
Northwest Regional Educational Laboratory
710 S. W. Second Avenue
Portland, Oregon 97204

SURVEY OF SCHOOL DISTRICT SUPERINTENDENTS

This survey is designed to obtain professional advice concerning needs in two areas: (1) school administrators' knowledge of computer assisted data management and decision making, and (2) teacher understanding of the use of the computer as an aid to instruction. The information gained is most important for developing appropriate training materials.

ADMINISTRATOR NEEDS

1. Please indicate the number of each kind of administrator you have in your district and check how desirable it is that they have training in computer assisted management and decision making.

Number	Very desirable	Somewhat desirable	Not needed
_____ Elementary	☐ 20%	☐ 53%	☐ 17%
_____ Junior high	☐ 30%	☐ 48%	☐ 5%
_____ Secondary	☐ 51%	☐ 35%	☐ 3%
_____ Central office	☐ 63%	☐ 26%	☐ 2%

2. How many administrators in each category do you estimate now have this training?

	Less than 10%	10% to 25%	25% to 50%	More than 50%
Elementary	☐ 82%	☐ 10%	☐ 2%	☐ 2%
Junior high	☐ 62%	☐ 14%	☐ 8%	☐ 4%
Secondary	☐ 52%	☐ 18%	☐ 13%	☐ 9%
Central office	☐ 40%	☐ 24%	☐ 20%	☐ 12%

3. Five years from now at what level do you estimate administrators in your district will be using computers for planning and management?

☐ 33% Much more than now ☐ 52% Somewhat more than now ☐ 14% About the same ☐ Somewhat less than now ☐ Much less than now

4. Would you prefer that administrators presently working for your district acquire their computer training in workshops in the district or get it at a college or university?

☐ 64% Workshops in the district ☐ 6% At a college or university ☐ 30% No preference

5. If you were to offer a workshop for administrators to obtain training in computer assisted data management and decision making, when would you prefer to hold it?

☐ 17% Fall ☐ 25% Winter ☐ 12% Spring ☐ 54% Summer

6. Do you know of training materials for school administrators in computer assisted data management and decision making which are currently available?

☐ 5% Yes, and the quality is satisfactory ☐ 33% Yes, but I don't know their quality ☐ 7% Yes, but the materials need improvement ☐ 54% No

7. Is there currently a person in your district who could assist in inservice training of administrators if he or she had economical and efficient materials to use?

☐ 55% Yes ☐ 41% No ☐ 2% We plan to employ such a person

8. Does your school district have or plan to obtain access to a computer terminal for instructional and management purposes?

	Presently have	Plan to obtain	No plans to obtain
For management	☐ 49%	☐ 19%	☐ 27%
For instruction	☐ 50%	☐ 15%	☐ 30%

(continued on reverse side)

9. If your district would budget money for an instructor, materials, and computer access for the training of present administrators in management and decision making techniques, approximately how much per participating administrator would be budgeted annually?

☐ Less than $100 (36%) ☐ $100 to $250 (32%) ☐ More than $250 (8%) ☐ None (14%)

TEACHER NEEDS

10. Do your secondary teachers currently use a computer terminal for classroom instruction?

	Always	Occasionally	No, but plan to add	No, and not in near future
Science teachers	☐ 3%	☐ 29%	☐ 11%	☐ 40%
Math teachers	☐ 13%	☐ 41%	☐ 10%	☐ 29%
Social science teachers	☐ .5%	☐ 14%	☐ 10%	☐ 51%
Other _____	☐ 4%	☐ 13%	☐ 4%	☐ 25%

11. In five years what role would you expect computers to play in classroom instruction?

☐ Much more important than now (21%) ☐ Somewhat more than now (56%) ☐ About the same as now (18%) ☐ Less than now (.2%) ☐ None at all (2.5%)

12. If your teachers were to receive training on how to use the computer in instruction, where should they get it?

☐ Inservice training within the school district (67%) ☐ At a college or university (25%) ☐ Neither; the training is not needed (4%) ☐ Other (please specify) (2%) _____ _____

13. If you had economical and efficient materials for training teachers in the instructional use of computers, would you offer inservice training?

☐ Yes (75%) ☐ No (20%) (If no, why?) _____

14. When would you offer such inservice training to teachers? (Check all that apply)

☐ Fall (42%) ☐ Winter (40%) ☐ Spring (32%) ☐ Summer (40%)

15. Do you know of materials for training teachers in the instructional use of computers?

☐ Yes, and they are satisfactory (70%) ☐ Yes, but they need improvement (10%) ☐ Yes, but I don't know their quality (27%) ☐ No (52%)

16. If your district budgeted money for instructor, materials, and computer access for training teachers in the use of computers, how much per participating teacher would be budgeted annually?

☐ Less than $75 (44%) ☐ $75 to $150 (18%) ☐ More than $150 (8%) ☐ None (18%)

17. Indicate the student enrollment of your school district.

☐ 2,500 to 4,999 (34%) ☐ 5,000 to 9,999 (32%) ☐ 10,000 to 24,999 (22%) ☐ 25,000 or more (11%)

18. In what state is your school district located?

Thank you again for your assistance. If you wish for us to remain in contact with you after the final development of the materials, fill in your name and address below.

Name _____ Title _____

Institution _____

Business Address _____

If you have any further comments that you feel would help us in the development of useful training materials, please feel free to include them. They are much appreciated.

Return in enclosed postage-paid envelope to: Office of Marketing and Dissemination, Northwest Regional Educational Laboratory, 710 S. W. Second Avenue, Portland, Oregon 97204.

SURVEY OF PROFESSORS OF EDUCATIONAL ADMINISTRATION

This survey is designed to obtain professional advice concerning the education needs of educational administration students in computer assisted data management and decision making. The information gained is most important for the development of appropriate training materials.

1. Indicate whether training in using the computer for management and decision making is a part of your curriculum and if it is required or elective.

	Required	Elective	Not offered but is being considered	Not offered nor is it being considered
Offered as a separate course at graduate level	☐ 3%	☐ 34%	☐ 17%	☐ 31%
Offered as a part of a course at graduate level	☐ 12%	☐ 16%	☐ 18%	☐ 22%
Offered as a separate course at undergraduate level	☐ 0%	☐ 12%	☐ 1%	☐ 37%
Offered as a part of a course at undergraduate level	☐ 0%	☐ 5%	☐ 3%	☐ 37%

2. If computer assisted decision making techniques are taught, check which of the following areas are offered.

☐ Operations research introduction	36%	☐ PERT/CPM	32%
☐ Linear programming	30%	☐ Queueing theory	11%
☐ Computer simulation	28%	☐ Others (please specify)	8%

3. How do you currently assess the importance of the computer for use in management and decision making in education administration?

☐ 38% Very important ☐ 56% Somewhat important ☐ 4% Not important

4. What is your five-year projection regarding the importance of the computer for use in management and decision making in educational administration?

☐ 27% Increase very much ☐ 64% Increase some ☐ 7% No change ☐ 1% Decrease some ☐ 1% Decrease Very much

5. Do you presently have knowledge of materials for the teaching of computer management techniques to students in educational administration?

☐ Yes, and I am satisfied with the quality	4%
☐ Yes, but the materials need improvement	29%
☐ Yes, but I don't know their quality	24%
☐ No	41%

6. Please indicate the accessibility your students have to computer terminals.

☐ 60% Very accessible (on campus) ☐ 35% Somewhat accessible (on or near campus) ☐ 5% Not accessible (neither on nor near campus)

(continued on reverse side)

7. Does your department or some other department on your campus offer inservice courses in computer assisted management and decision making techniques for practicing educational administrators?

☐ 12% Yes, our department does ☐ 26% Yes, another department does (please specify) ☐ 59% No

8. In what state is your college or university located? _____

9. What is the total enrollment of your university or college?

☐ 2% Less than 1,000 ☐ 51% 1,000 to 10,000 ☐ 30% 10,000 to 20,000 ☐ 16% More than 20,000

10. What is the approximate number of students majoring in educational administration at your school?

_____

11. Of these students, what percentage will have received training in computer assisted management and decision making techniques by the conclusion of their program?

_____%

Thank you again for your assistance. If you wish for us to remain in contact with you after the final development of the materials, fill in your name and address below.

Name _____ Title _____

Institution _____

Business Address _____

If you have any further comments that you feel would help us in the development of useful training materials in this area, please feel free to include them. They are much appreciated.

Return in enclosed postage-paid envelope to:

Office of Marketing and Dissemination
Northwest Regional Educational Laboratory
710 S. W. Second Avenue
Portland, Oregon 97204

SURVEY OF PROFESSORS OF BUSINESS ADMINISTRATION

This survey is designed to obtain professional advice concerning the education needs of business students in operations research. The information gained is most important for the development of appropriate training materials.

1. Indicate whether training in operations research is a part of your curriculum and if it is required or elective.

	Required	Elective	Not offered but is being considered	Not offered nor is it being considered
Offered as a separate course at graduate level	☐ 36%	☐ 8%	☐ 5%	☐ 20%
Offered as a part of a course at graduate level	☐ 10%	☐ 4%	☐ 2%	☐ 17%
Offered as a separate course at undergraduate level	☐ 28%	☐ 35%	☐ 7%	☐ 17%
Offered as a part of a course at undergraduate level	☐ 25%	☐ 9%	☐ 4%	☐ 12%

2. If operations research is taught, check which of the following areas are offered.

☐ Operations research introduction	78%	☐ PERT/CPM	60%
☐ Linear programming	74%	☐ Queueing theory	60%
☐ Computer simulation	54%	☐ Others (please specify)	21%

_____

_____

3. How do you currently assess the importance of the computer for use in management and decision making in business administration?

☐ 79% Very important ☐ 20% Somewhat important ☐ 0% Not important

4. What is your five-year projection regarding the importance of the computer for use in operations research?

☐ 47% Increase very much ☐ 49% Increase some ☐ 4% No change ☐ 0% Decrease some ☐ 0% Decrease very much

5. Do you presently have knowledge of materials for the teaching of operations research using the computer?

☐ Yes, and I am satisfied with the quality	11%
☐ Yes, but the materials need improvement	38%
☐ Yes, but I don't know their quality	24%
☐ No	27%

6. Please indicate the accessibility your students have to computer terminals.

☐ 60% Very accessible (on campus) ☐ 28% Somewhat accessible (on or near campus) ☐ 12% Not accessible (neither on nor near campus)

7. Does your department or any other department offer inservice courses in operations research for business people in the field?

☐ 13% Yes, our department does ☐ 12% Yes, another department does (please specify) ☐ 74% No

_____

(continued on reverse side)

8. In what state is your college or university located? _____

9. What is the total enrollment of your university or college?

☐ Less than 1,000 (10%) ☐ 1,000 to 10,000 (61%) ☐ 10,000 to 20,000 (17%) ☐ More than 20,000 (11%)

10. What is the approximate number of students majoring in business at your school?

Undergraduate: _____

Graduate: _____

11. Of these students, what percentage will have received training in operations research by the conclusion of their program?

Undergraduate: _____%

Graduate: _____%

Thank you again for your assistance. If you wish for us to remain in contact with you after the final development of the materials, fill in your name and address below.

Name _____ Title _____

Institution _____

Business Address _____

If you have further comments that you feel would help us in the development of useful training materials in this area, please feel free to include them. They are much appreciated.

Return in enclosed postage-paid envelope to:

Office of Marketing and Dissemination
Northwest Regional Educational Laboratory
710 S. W. Second Avenue
Portland, Oregon 97204

TABLE 1: UNIVERSE DATA RE: SURVEYED TARGET AUDIENCES

Audience Surveyed	Description of Audience Surveyed	Total Approximate Universe for Each Audience
Professors of Business Administration (Department heads)	o There are approximately 600 schools of business administration. o 469 professors (78% of 600) were surveyed.	o There are about 18,000 professors of business in postsecondary institutions. o 133,822 bachelor degrees in B.A. were granted in 1975; 36,364 master's degrees; 1,011 doctorates. o The specific number of potential inservices users is unknown but expected to exceed 10,000 within industry, government and the professional agencies
Professors of Educational Administration (Department heads)	o There are 960 member professors in the UCEA. o There are 47 member secondary institutions in the UCEA. o 368 professors (38% of 960) were surveyed.	o There are 3,000 total professors of education in the USA. o There are 350 institutions offering curriculum in educational administration. o 10,375 master's degrees in educational administration were granted in 1975 and 1,315 doctorates.
Professors of Teacher Education (Department heads)	o There are 813 member institutions in the AACTU. o 287 professors (35% of 813) were surveyed.	o 1,387 postsecondary institutions claim to prepare teachers. o There are about 24,000 teacher educators in the USA. o 167,000 bachelor degrees in education were granted in 1975; 110,000 master's degrees; 7,443 doctorates.
Superintendents of Large School Districts	o There are 4,002 school districts (elementary/secondary) each with student enrollment in excess of 2,500. o 1,664 superintendents (42% of 4,002) were surveyed.	o There are 16,330 total school districts in USA. o There are 22,737 total junior/senior high schools. o There are approximately 55,000 elementary school principals and assistants; 17,000 junior high principals and assistants; 29,000 secondary principals and assistants; 68,000 central office staff
Secondary Teachers (Primarily in mathematics and social studies)	o There are 14,000 secondary math teachers reachable at home. o There are 15,000 secondary social studies teachers reachable at home. o 3,085 (11% of 29,000) were surveyed.	o There are 1.2 million public elementary teachers in USA. o There are 1.0 million public secondary teachers. o 18.9 million junior/senior students take social studies courses. o 13.2 million students are enrolled in math courses. o 12.5 million students are enrolled in natural science courses o 6.4 million students are enrolled in business education courses o 1.4 million students are enrolled in private schools, grades 9-12.

SOURCES:

- o Standard Education Almanac, 1975-76 edition
- o National Center for Educational Statistics at DHEW
- o American Association of Colleges for Teacher Education
- o University Council for Educational Administration
- o American Association of Collegiate Schools of Business

SUMMARY OF PRELIMINARY FINDINGS RE:
SURVEY OF SECONDARY TEACHERS

QUESTION: Is there a market for Selecting and Specifying Computer-Enhanced Units?

There appears to be a considerable market for the product, particularly for inservice training.

- Sixty-four percent of the survey respondents feel that ability to use the computer is a skill a teacher in his or her field should have.
- A majority of secondary teachers (grades 7-12) of math and social studies have had no training on how to use the computer in instruction (61 percent), yet 72 percent would like more training.
- Fifty-six percent of respondents prefer this training to be in the form of a district or local inservice program, while 16 percent would prefer a college course.
- Seventy-one percent would like more training in ability to use computer programs for instruction.

QUESTION: Is there a need for such a product as Selecting and Specifying?

Only 2 percent of the teachers surveyed know of and are satisfied with materials presently available. Seventy-two percent know of no materials for training teachers in computer uses in instruction.

QUESTION: What is the expected manner of use of Selecting and Specifying?

Fifty-six percent of those desiring further training prefer district or local inservice to a college or university course. Fifty-four percent would prefer that an inservice workshop be held during the school year, while 32 percent would prefer such a workshop be held before school opens in the fall. Only 7 percent would not be interested in a one- or two-day inservice workshop.

SUMMARY OF PRELIMINARY FINDINGS RE:
SURVEY OF PROFESSORS OF TEACHER EDUCATION

QUESTION: Is there a market for Selecting and Specifying Computer-Enhanced Units?

The survey identifies a substantial user audience as primarily math and science teachers, grades 7-12.

- "Understanding the role of the computer" is seen as important for 100 percent of junior high and secondary teachers.
- Ability to "use the computer for classroom instruction" is seen as important for 88 to 99 percent of teachers in all subject areas surveyed, from the junior high level through secondary.
- Teacher education professors feel ability to use the computer is "very important" for secondary math teachers (80 percent), secondary science teachers (76 percent), junior high math teachers (58 percent), and junior high science teachers (53 percent).

A potentially large, undeveloped market appears to exist with teachers of vocational education.

- Fourty-four percent of respondents feel the ability to use the computer is very important for vocational education teachers.
- Only 16 percent offer any training at all for this audience.

Secondary business education appears to be a potential market, since 35 percent already offer some training.

QUESTION: Is there a need for such a product as Selecting and Specifying?

The product should meet a clearly felt need:

- Only 2 percent know of similar materials of satisfactory quality.
- Half know of such materials, but either don't know the quality or feel they need improvement.
- Nearly half are not familiar with any training materials to prepare teachers in the use of computers for instruction.

QUESTION: What is the expected manner of use of Selecting and Specifying?

- About half of the teacher education programs in secondary math and science presently provide training in using the computer in instruction. Eighty-six percent project an increase in the emphasis placed on this training in the next five years. Since 77 percent presently do not offer inservice courses for practicing teachers, this is an area where much of the increase may be seen.
- The present pattern of offering such training indicates the products could be put to immediate use in

existing preservice programs. The greatest potential, however, may well exist in workshops and courses for inservice training.